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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/018,783 02/04/98 RITZDORF

T 11928US01

MMC2/1004

ROCKEY, MILNAMOW & KATZ
TWO PRUDENTIAL PLAZA, 47TH FLOOR
180 NORTH STETSON
CHICAGO IL 60601

EXAMINER

COLLINS, D

ART UNIT

PAPER NUMBER

2823

DATE MAILED:

10/04/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/018,783

Applicant(s)

LITZ DORF et al.

Examiner

Deven M. Collins

Group Art Unit

2823



☒ Responsive to communication(s) filed on 8-18-00

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-31 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-31 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 1

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1, 6, 11, 18, 24 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Teong (5,693,563 dated 12/2/97).

Teong shows the method as claimed in Figures 1-7 with corresponding text. Teong discloses the application of copper damascene connectors to a double level metal process. A dual damascene copper connector 18 whose upper surface is coplanar with the upper surface of the insulating layer 25 in which it is embedded is described. Out-diffusion of copper 8 from the connector is prevented by at least two barrier layers. One or two barrier layers (4,11) are located at the interface between the connector and the insulating layer 15 while another barrier layer comprises conductive material and covers the upper surface of the connector. When a second damascene connector 28 is formed above the first connector the conductive barrier layer

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facilitates good contact between the two connectors. It also acts as an etch stop layer (11,14) during the formation of the second connector with cavity (2,22), polysilicon area 3, and trench 6.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-5, 7-10, 12-17, 19-23, 25-29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teong (5,693,563 dated 12/2/97) in view of Chan et al. (6,100,195, dated 8/8/00).

Teong shows as stated above in 35 U.S.C. 102.

However, Teong does not show CMP and electroplating.

Chan et al. disclose a method of forming a copper interconnect line (16,24) on a dielectric layer 18 by depositing a passivating metal layer with device 10, IMD layer 12, trench hole 13, diffusion barrier layer 14 and silicon oxide layer 20.

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Teong to include CMP and electroplating because of

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reasonable expectation of achieving the specific result of improving the electrical connections from the problems associated with aluminum interconnect technology.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Deven M. Collins whose telephone number is (703) 305-7840. The examiner can normally be reached on Monday-Friday from 6:30 AM to 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy, can be reached on (703) 308-4918. The fax phone number for this Group is (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

DMC

October 2, 2000


Deven M. Collins
Examiner